

Appendix A:
Data Sources



Appendix A. Data Sources

Detailed Mortality Statistics

Mortality statistics for asthma as a primary cause of death are obtained for the North Carolina State Center for Health Statistics, which are published on their website. The counts of deaths for each cause are shown for the race-sex and age categories. Race categories are white (W) and minority (M); minority deaths are predominately Black (over 98 percent) in North Carolina. The cause of death is the underlying cause classified according to the tenth revision of the International Classification of Diseases (ICD).¹

Data for asthma as a contributory cause of death were also obtained by the North Carolina State Center for Health Statistics. They provided the analysis of vital statistics obtained from death certificates, which allow for the inclusion of more information than the primary cause of death.

HEDIS – Medicaid Data

The Health Plan Employer Data and Information Set, (HEDIS), is a set of standardized performance measures designed to ensure that purchasers and consumers have the information they need to reliably compare the performance of managed health care plans (including Medicaid). HEDIS is sponsored, supported, and maintained by the National Committee for Quality Assurance (NCQA). The performance measures in HEDIS are related to many significant public health issues and include asthma.²

Hospitalization Data

The North Carolina Asthma Program receives hospitalization data from the State Center for Health Statistics, which receives the data from a private data processor. North Carolina hospitals are required to “submit information necessary for a review and comparison of charges, utilization patterns, and quality of medical services” (Senate Bill 345 (article 11A, 131E-214)) to a private

company, Solucient, that currently acts as the statewide data processor. The patient-level information the hospitals submit is drawn from their billing databases. Several types of hospitals are not included, such as: military and veteran hospitals, ambulatories, specialty hospitals, rehabilitation facilities, psychiatric facilities, and prison hospitals. The North Carolina hospital discharge data are comprised of hospitalization information such as diagnoses, date of admittance and date of discharge, length of stay, information on the patient such as county of residence and gender, patient status at discharge, payer, and total amount billed for the hospital stay. Hospital discharge data report on hospital stays, and do not provide enough information to identify individual patients. Therefore, it can not be determined if the same person was admitted to the hospital once or several times during the reporting period.

National Health Interview Survey

The National Health Interview Survey (NHIS) is the principal source of information on the health of the civilian non-institutionalized population of the United States and is one of the major data collection programs of the National Center for Health Statistics (NCHS). The main objective of the NHIS is to monitor the health of the United States population through the collection and analysis of data on a broad range of health topics. A major strength of this survey lies in the ability to display these health characteristics by many demographic and socioeconomic characteristics.³

The NHIS covers the civilian non-institutionalized population of the United States living at the time of the interview. Because of technical and logistical problems, several segments of the population are not included in the sample or in the estimates from the survey. Persons excluded are patients in long-term care facilities; persons on active duty with the Armed Forces (though their dependents are included); and U.S. nationals living in foreign countries.³

National Survey of Children's Health, 2003

The National Survey of Children's Health is sponsored by the Maternal and Child Health Bureau of the U.S. Department of Health and Human Services. The National Center for Health Statistics at the CDC conducted the state-based telephone survey of households with children less than 18 years of age. The purpose of this survey is to estimate national and state level prevalence for a variety of physical, emotional, and behavioral health indicators in combination with information on the child's family context and neighborhood environment. The respondent was a parent or guardian who knew the most about the selected child's health.⁴

North Carolina Behavior Risk Factor Surveillance System (N.C. BRFSS)

The N.C. BRFSS is a random telephone survey of state residents aged 18 and older in households with telephones. BRFSS was initially developed in the early 1980's by the Centers for Disease Control and Prevention (CDC) in collaboration with state health departments and is currently conducted in all 50 states, the District of Columbia, and three United States territories. The North Carolina Division of Public Health has participated in the BRFSS since 1987. Through BRFSS, information is collected in a routine, standardized manner at the state level on a variety of health behaviors and preventive health practices related to the leading causes of death and disability such as cardiovascular disease, cancer, diabetes, asthma, and injuries. BRFSS interviews are conducted monthly and data are analyzed annually.⁵

North Carolina Child Health Assessment and Monitoring Program (CHAMP)

The Child Health Assessment and Monitoring Program (CHAMP) survey was developed in the

fall of 2004 and implemented in January 2005. CHAMP is the first survey of its kind in North Carolina to measure the health characteristics of children, up to age 17. Eligible children for the CHAMP survey are drawn each month from the BRFSS (Behavioral Risk Factor Surveillance System) telephone survey of adults, ages 18 and older. All adult respondents with children living in their households are invited to participate in the CHAMP survey. One child is randomly selected from the household and the adult most knowledgeable about the health of the selected child is interviewed in a follow-up survey. All questions about the selected child are answered only by the most knowledgeable adult. CHAMP surveys will be revised each year to meet the child health surveillance needs of North Carolina.⁶

CHAMP, by collecting data for young children, will contribute to a seamless health data system for all North Carolina citizens from birth to old age. Questions on the CHAMP survey pertain to a wide variety of health-related topics, including breast feeding, early childhood development, access to health care, oral health, mental health, physical health, nutrition, physical activity, family involvement, and parent opinion on topics such as tobacco and childhood obesity. Collected annually, the CHAMP survey data will help monitor child health status and identify child health problems, will help evaluate child health programs and services, will help health professionals make evidence-based decisions, policies and plans, and will help monitor progress towards selected health targets, such as Healthy Carolinians 2010.⁶

School Health Profiles – Principal's Survey

The School Health Profiles is a biennial survey conducted by state and local education and health agencies among middle and high school principals. Profiles monitors the current status of: school health education requirements and content, physical education requirements, asthma management activities, food service, competitive foods practices and policies, family and community

involvement in school health programs, and school health policies on HIV and AIDS prevention, tobacco-use prevention, violence prevention, and physical activity. The data profiles are conducted among a sample of secondary schools in a state or school district, and Profiles data are collected from the principal and lead health education teachers at each sampled school using self-administered questionnaires.⁷ For national data, the CDC publication Grunbaum et al. (2005) was utilized.⁸

15 national health objectives for Healthy People 2010 and three of the 10 leading health indicators, to assess trends in priority health-risk behaviors among high school students, and to evaluate the impact of broad school and community interventions at the national, state, and local levels.¹¹

North Carolina's School Health Education Profile: Principal's Survey was sent to a randomly selected 402 middle and high schools across the state. Of the 281 completed surveys that were returned and eligible for analysis, 158 were middle schools, 111 were high schools, and 12 were junior/senior combined schools.⁹

School Health Services Report for Public Schools

The Annual School Health Services Report includes data submitted by school nurses, based on their knowledge of health services provided by school nurses and other health professionals in their schools from North Carolina Public Schools only. It does not include data from state residential, private, charter or federal schools. The purpose of this survey is to get an overall view of school health services, to identify conditions and situations affecting students in North Carolina (inc. chronic disease and injuries), to gain a profile of the student to nurse ratio across the state, and to identify health policies in schools.¹⁰

Youth Risk Behavior Survey (YRBS)

The Youth Risk Behavior Surveillance System monitors six categories of priority health-risk behaviors among youth and young adults. The YRBS includes a national school-based survey conducted by CDC and state and local school-based surveys conducted by state and local education and health agencies. The YRBS data are used to: measure progress toward achieving

References

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Appendix B:
***Asthma Medication Possession
and Self Administration Law***



Appendix B. Asthma Medication Possession and Self Administration Law

115C 375.2. Possession and self administration of asthma medication by students with asthma or students subject to anaphylactic reactions, or both.

- (a) Local boards of education shall adopt a policy authorizing a student with asthma or a student subject to anaphylactic reactions, or both, to possess and self administer asthma medication on school property during the school day, at school sponsored activities, or while in transit to or from school or school sponsored events. As used in this section, “asthma medication” means a medicine prescribed for the treatment of asthma or anaphylactic reactions and includes a prescribed asthma inhaler or epinephrine auto injector. The policy shall include a requirement that the student’s parent or guardian provide to the school:
- (1) Written authorization from the student’s parent or guardian for the student to possess and self administer asthma medication.
 - (2) A written statement from the student’s health care practitioner verifying that the student has asthma or an allergy that could result in an anaphylactic reaction, or both, and that the health care practitioner prescribed medication for use on school property during the school day, at school sponsored activities, or while in transit to or from school or school sponsored events.
 - (3) A written statement from the student’s health care practitioner who prescribed the asthma medication that the student understands, has been instructed in self administration of the asthma medication, and has demonstrated the skill level necessary to use the asthma medication
- and any device that is necessary to administer the asthma medication.
- (4) A written treatment plan and written emergency protocol formulated by the health care practitioner who prescribed the medicine for managing the student’s asthma or anaphylaxis episodes and for medication use by the student.
 - (5) A statement provided by the school and signed by the student’s parent or guardian acknowledging that the local school administrative unit and its employees and agents are not liable for an injury arising from a student’s possession and self administration of asthma medication.
 - (6) Other requirements necessary to comply with State and federal laws.
- (b) The student must demonstrate to the school nurse, or the nurse’s designee, the skill level necessary to use the asthma medication and any device that is necessary to administer the medication.
 - (c) The student’s parent or guardian shall provide to the school backup asthma medication that shall be kept at the student’s school in a location to which the student has immediate access in the event of an asthma or anaphylaxis emergency.
 - (d) Information provided to the school by the student’s parent or guardian shall be kept on file at the student’s school in a location easily accessible in the event of an asthma or anaphylaxis emergency.
 - (e) If a student uses asthma medication prescribed for the student in a manner other than as prescribed, a school may impose on the student disciplinary action according to the school’s disciplinary policy. A school may not impose disciplinary action that limits or restricts the student’s immediate access to the asthma medication.

- (f) The requirement that permission granted for a student to possess and self administer asthma medication shall be effective only for the same school and for 365 calendar days and must be renewed annually.
- (g) No local board of education, nor its members, employees, designees, agents, or volunteers, shall be liable in civil damages to any party for any act authorized by this subsection [section], or for any omission relating to that act, unless that act or omission amounts to gross negligence, wanton conduct, or intentional wrongdoing. (2005 22, s. 1.)

Obtained from the North Carolina General Assembly, general statutes website:
<http://www.ncga.state.nc.us/gascripts/Statutes/Statutes.asp>

Appendix C:
Additional Mortality Data



Table 1. Rates^{1,2} (per 1,000,000) of Mortality Due to a Primary Cause of Asthma³, by Year, Age, Race, and Sex, North Carolina, 1999

	Age					Race		Sex	
	>5	5 to 14	15 to 34	35 to 64	65+	White	Minority	Male	Female
Rate	*	*	5.16	15.86	72.36	12.29	35.26	12.90	20.70
(Count)			(12)	(48)	(69)	(74)	(58)	(42)	(90)

*Number of deaths <5 and >0

¹North Carolina population estimates taken from the July 1 estimates for each year

²Numbers rounded to the nearest hundredth

³Asthma death defined as primary cause of death as asthma (ICD-10 J45-J46)

Minority includes African American, Asian, and American Indian and Alaskan Native.

Data Source: North Carolina State Center for Health Statistics: Detailed Mortality Statistics, 1999

Table 2. Rates¹ (per 1,000,000) of Mortality Due to a Primary Cause of Asthma², by Year, Sex, and Race³, North Carolina, 1999

	White Males	White Females	Minority Males	Minority Females
Rate	8.99	14.9	28.23	40.39
(95% CI)	(5.5, 13.9)	(11.1, 19.6)	(16.4, 45.2)	(28.4, 55.7)
Count	22	52	20	38

Confidence Intervals rounded to nearest tenth

¹Rates are age adjusted to the 2000 US standard population

²Asthma death defined as primary cause of death as asthma (ICD-10 J45-J46)

³Minority includes African American, Asian, and American Indian and Alaskan Native

Data Source: North Carolina State Center for Health Statistics: Detailed Mortality Statistics, 1999

Table 3. Rates^{1,2} (per 1,000,000) of Mortality Due to Asthma³ as a Primary or Contributory Cause of Death, by Year, North Carolina, 1999

	Rate	(95% CI)	Count
Primary	17.25	(14.3, 20.2)	132
Contributory	23.35	(19.9, 26.8)	175

Confidence Intervals rounded to nearest tenth

¹Rates are age adjusted to the 2000 US standard population

²North Carolina population estimates taken from the July 1 estimates for each year

³Asthma death defined as cause of death as asthma (ICD-10 J45-J46)

Data Source: North Carolina State Center for Health Statistics, 1999

Table 4. Rates^{1,2}(per 1,000,000) of Mortality Due to Asthma³ as a Contributory Cause of Death, by Sex and Year, North Carolina, 1999

	Rate	(95% CI)	Count
Males	16.62	(12.3, 22)	51
Females	28.01	(23.1, 32.9)	124

Confidence Intervals rounded to nearest tenth

¹Rates are age adjusted to the 2000 US standard population

²North Carolina population estimates taken from the July 1 estimates for each year

³Asthma death defined as cause of death as asthma (ICD-10 J45-J46)

Data Source: North Carolina State Center for Health Statistics, 1999

Table 5. Rates^{1,2}(per 1,000,000) of Mortality Due to Asthma³ as a Contributory Cause of Death, by Race and Year, North Carolina, 1999

	Rate	(95% CI)	Count
Whites	18.26	(14.8, 21.7)	110
Minorities[§]	44.12	(33.9, 56.4)	65

[§]Minority includes African American, Asian, and American Indian and Alaskan Native

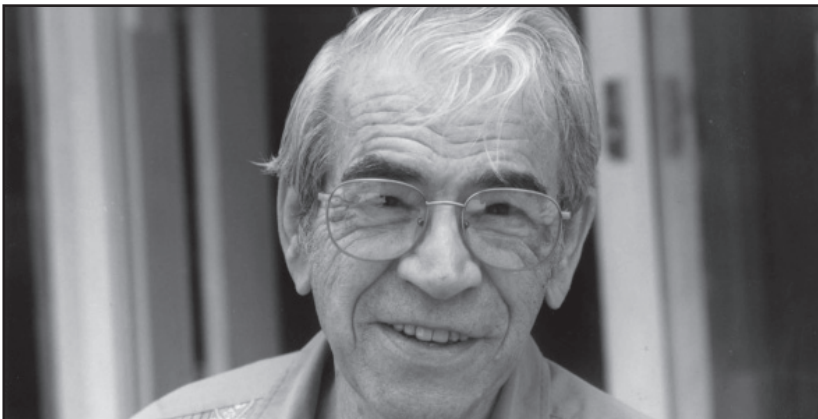
¹Rates are age adjusted to the 2000 US standard population

²North Carolina population estimates taken from the July 1 estimates for each year

³Asthma death defined as cause of death as asthma (ICD-10 J45-J46)

Data Source: North Carolina State Center for Health Statistics, 1999

Appendix D:
County Specific Data



Appendix D. County Specific Data

Table 1. Mortality Rates (per 1,000,000), North Carolina Counties, 1999-2005

County	Mortality Rate (per 1,000,000) 1999-2005	County	Mortality Rate (per 1,000,000) 1999-2005
Alamance	11.1*	Granville	12.9*
Alexander	9.6*	Greene	8.5*
Alleghany	77.1*	Guilford§	13.6
Anson	13.1*	Halifax	17.6*
Ashe	13.4*	Harnett	13.8*
Avery	9.3*	Haywood	18*
Beaufort	40.2*	Henderson	26.7*
Bertie	67.5*	Hertford	21.2*
Bladen	10.2*	Hoke	22.6*
Brunswick	4.1*	Hyde	29.1*
Buncombe§	13.4*	Iredell	6.3*
Burke	28.1*	Jackson	13.3*
Cabarrus	9.4*	Johnston	12.4*
Caldwell	10.6*	Jones	16.2*
Camden	21.4*	Lee	13.2*
Carteret	13.7*	Lenoir	22.6*
Caswell	14.1*	Lincoln	12.5*
Catawba	12.5*	Macon	21.4*
Chatham	12.6*	Madison	8.4*
Cherokee	13.2*	Martin	33.3*
Chowan	46.6*	McDowell	15.5*
Clay	53.7*	Mecklenburg§	11.2
Cleveland	12*	Mitchell	21*
Columbus	6.1*	Montgomery	18.4*
Craven	45.2	Moore	25.7*
Cumberland§	15.8	Nash	11.2*
Currituck	8.2*	New Hanover§	11.8*
Dare	10.2*	Northhampton	38.2*
Davidson§	18.8*	Onslow§	13*
Davie	13.5*	Orange	5.6*
Duplin	23*	Pamlico	64.2*
Durham§	10.7*	Pasquotank	32*
Edgecombe	18.4*	Pender	3.8*
Forsyth§	11.1	Perquimans	0*
Franklin	13.1*	Person	18.2*
Gaston§	15.6*	Pitt	22.9*
Gates	46.3*	Polk	26.6*
Graham	0*	Randolph	12.4*

Table 1. Continued

County	Mortality Rate (per 1,000,000) 1999-2005	County	Mortality Rate (per 1,000,000) 1999-2005
Richmond	10.7*	Tyrrell	0*
Robeson	22.6*	Union	10.5*
Rockingham	18.1*	Vance	15.2*
Rowan	8.8*	Wake [§]	7.2
Rutherford	18.4*	Warren	16.6*
Sampson	21.5*	Washington	36.9*
Scotland	27.7*	Watauga	11.7*
Stanly	11.3*	Wayne	13.1*
Stokes	0*	Wilkes	10*
Surry	9.3*	Wilson	24.3*
Swain	25.1*	Yadkin	13.6*
Transylvania	28.2*	Yancey	18.5*

[§]-denotes counties considered Urban

*-rates based less than 20 deaths should be interpreted with caution.

Data Source: North Carolina State Center for Health Statistics and Detailed Mortality Statistics, 1999-2004

Table 2. Hospitalization Rates (per 100,000), Total and by Sex, North Carolina Counties, 1999-2004

County	Total 1999-2001	Total 2002-2004	Male 1999-2001	Male 2002- 2004	Female 1999- 2001	Female 2002- 2004
Alamance	109.1	113.5	99.4	92.1	117.9	133.5
Alexander	88.2	102.0	67.5	67.6	108.8	136.3
Alleghany	87.3	123.1	*	*	146.9	164.3
Anson	205.6	325.0	204.1	282.0	206.9	367.5
Ashe	95.3	112.1	63.8	80.7	125.8	143.1
Avery	143.5	212.8	107.6	165.6	182.7	267.4
Beaufort	275.2	207.8	167.9	152.6	372.5	258.4
Bertie	235.7	180.3	170.7	147.2	291.8	209.6
Bladen	166.1	164.6	136.8	128.0	192.6	198.9
Brunswick	164.2	132.6	97.5	84.3	228.4	179.3
Buncombe [§]	128.5	130.6	87.8	82.3	165.9	175.4
Burke	113.5	94.4	76.7	57.4	150.0	131.7
Cabarrus	154.9	122.3	108.1	91.1	200.2	152.8
Caldwell	132.1	129.4	127.2	95.5	136.8	162.6
Camden	187.7	202.6	220.3	*	*	266.6
Carteret	124.1	144.7	93.7	100.6	153.6	187.0
Caswell	32.6	38.0	*	*	*	*
Catawba	74.8	71.5	60.8	59.1	88.4	83.6
Chatham	61.7	42.8	30.1	*	91.9	66.2

Table 2. Continued

County	Total 1999-2001	Total 2002-2004	Male 1999- 2001	Male 2002- 2004	Female 1999- 2001	Female 2002- 2004
Cherokee	101.3	135.4	70.7	97.3	130.0	171.6
Chowan	152.9	136.8	168.7	113.3	139.1	157.6
Clay	75.6	92.2	*	*	*	138.2
Cleveland	158.9	168.4	94.2	115.6	219.0	217.5
Columbus	233.5	219.5	219.9	186.7	245.8	250.2
Craven	156.9	158.0	109.9	108.1	204.4	209.0
Cumberland [§]	135.3	146.4	130.0	135.0	140.6	158.2
Currituck	100.1	96.6	*	*	145.2	130.9
Dare	52.9	91.2	*	45.7	93.0	137.6
Davidson [§]	117.0	116.9	69.5	71.2	163.0	160.8
Davie	75.8	101.0	*	45.3	119.5	155.0
Duplin	157.8	133.4	90.8	112.6	222.9	154.3
Durham [§]	99.5	99.9	82.7	70.4	115.0	127.5
Edgecombe	269.8	275.0	220.5	231.3	311.9	313.3
Forsyth [§]	91.8	104.7	64.0	73.3	117.2	133.7
Franklin	113.4	141.4	84.3	100.2	141.4	181.9
Gaston [§]	121.5	134.6	96.5	95.7	144.9	171.2
Gates	114.2	110.7	135.4	*	*	138.9
Graham	*	128.4	*	*	*	193.8
Granville	144.6	131.3	99.1	79.0	193.2	190.7
Greene	137.1	143.2	126.7	113.9	148.1	174.6
Guilford [§]	101.0	109.2	75.7	83.4	124.0	133.1
Halifax	167.6	266.9	129.9	176.1	201.7	349.6
Harnett	117.3	149.5	76.4	110.7	156.8	187.7
Haywood	132.4	136.8	79.9	74.6	180.5	194.2
Henderson	170.5	159.4	119.6	98.7	217.9	216.7
Hertford	209.2	168.2	121.3	110.0	283.6	217.5
Hoke	104.1	119.2	93.1	115.0	115.3	123.4
Hyde	440.9	180.1	389.5	*	495.3	279.6
Iredell	186.6	223.4	161.6	190.3	210.6	255.6
Jackson	147.8	129.8	118.0	105.1	175.9	153.7
Johnston	152.3	160.1	100.8	105.3	202.6	214.9
Jones	164.5	290.2	*	154.7	216.4	417.7
Lee	157.4	155.6	92.5	76.7	220.0	233.4
Lenoir	270.0	293.7	244.7	234.9	292.5	347.2
Lincoln	104.0	125.2	78.5	92.3	129.1	158.0
McDowell	70.8	75.0	49.1	46.3	92.2	103.9
Macon	108.1	80.8	76.7	59.8	137.0	100.2
Madison	108.7	104.9	78.9	*	137.9	144.8
Martin	270.9	439.0	163.1	313.0	364.8	547.2
Mecklenburg [§]	130.0	125.5	104.7	101.2	154.2	149.2
Mitchell	67.8	77.3	*	*	90.5	90.5
Montgomery	88.2	118.6	56.0	106.2	121.7	131.4
Moore	111.2	127.7	70.4	73.1	148.8	178.6

Table 2. Continued

County	Total 1999-2001	Total 2002-2004	Male 1999- 2001	Male 2002- 2004	Female 1999- 2001	Female 2002- 2004
Nash	140.1	191.4	99.2	143.6	177.7	236.2
New Hanover [§]	93.7	88.5	68.3	73.7	117.3	102.5
Northhampton	172.3	171.9	119.9	115.7	220.5	223.5
Onslow [§]	113.6	123.4	66.0	70.7	174.3	188.4
Orange	31.4	48.1	25.6	38.2	36.7	57.2
Pamlico	155.3	145.8	*	*	240.8	198.2
Pasquotank	332.7	280.4	271.5	216.2	388.7	341.7
Pender	103.6	94.7	57.0	70.4	149.6	119.7
Perquimans	192.8	241.8	152.3	167.2	230.2	309.6
Person	156.9	105.7	124.1	87.7	187.4	122.5
Pitt	145.6	109.5	142.1	95.0	148.7	122.6
Polk	67.0	95.2	*	*	102.9	117.8
Randolph	105.0	101.8	76.9	72.2	132.3	131.0
Richmond	564.8	396.0	433.6	259.8	689.2	528.5
Robeson	325.9	360.2	234.0	264.4	410.9	451.9
Rockingham	140.1	209.3	109.5	168.3	168.5	247.9
Rowan	126.7	97.2	110.4	72.2	142.5	121.9
Rutherford	115.9	143.2	76.6	78.4	152.7	203.8
Sampson	147.7	164.5	98.5	111.4	194.8	217.7
Scotland	259.9	259.9	246.8	209.0	271.4	304.8
Stanly	179.8	164.9	165.0	123.9	194.0	205.2
Stokes	43.2	59.9	*	43.3	65.9	75.9
Surry	119.9	158.1	89.6	124.1	148.6	191.1
Swain	138.5	179.5	103.7	159.7	172.5	198.1
Transylvania	70.6	88.1	49.5	*	90.3	130.2
Tyrrell	*	*	*	*	*	*
Union	120.3	116.9	110.8	105.3	129.7	128.5
Vance	235.4	214.3	168.5	137.3	295.1	283.8
Wake [§]	83.4	85.8	67.6	63.7	98.8	107.7
Warren	105.1	154.7	*	121.1	143.6	187.5
Washington	134.0	177.6	108.7	140.9	156.5	210.4
Watauga	101.7	110.5	69.5	90.3	133.1	130.7
Wayne	131.6	157.2	89.3	130.8	173.5	182.8
Wilkes	125.2	145.1	72.1	77.6	176.8	211.2
Wilson	200.3	168.4	140.0	150.0	254.4	185.4
Yadkin	103.5	90.2	63.6	64.1	141.8	115.6
Yancey	87.8	70.4	*	75.5	102.2	*

[§]-denotes counties considered Urban

*Rates based on less than 20 visits should be interpreted with caution.

Data Source: North Carolina State Center for Health Statistic, 1999-2004

Table 3. Hospitalization Rates (per 100,000), by Age, North Carolina Counties, 1999-2001

County	Age 0-4 1999-2001	Age 5-14 1999-2001	Age 15-34 1999-2001	Age 35-64 1999-2001	Age 65+ 1999-2001
Alamance	436.7	123.7	56.1	83.1	113.3
Alexander	504.7	*	*	58.7	*
Alleghany	*	*	*	*	*
Anson	579.8	431.9	145.8	128.5	*
Ashe	573.4	*	*	*	*
Avery	*	*	*	206.0	*
Beaufort	409.6	209.0	124.9	224.5	633.0
Bertie	*	*	*	271.4	222.7
Bladen	616.7	181.7	*	119.3	217.2
Brunswick	324.3	138.3	162.1	151.5	164.5
Buncombe [§]	351.5	84.3	80.6	116.4	189.5
Burke	352.3	102.9	74.6	85.0	168.9
Cabarrus	388.2	140.4	89.9	146.6	203.1
Caldwell	587.3	172.0	59.9	108.3	83.0
Camden	*	*	*	*	*
Carteret	307.3	115.1	68.3	139.7	113.0
Caswell	*	*	*	*	*
Catawba	286.1	76.0	37.6	60.8	86.1
Chatham	*	*	*	63.7	100.2
Cherokee	*	*	*	76.5	142.7
Chowan	*	*	*	161.0	*
Clay	N/A	N/A	N/A	*	*
Cleveland	457.5	97.7	55.0	145.6	307.5
Columbus	1305.3	320.1	102.1	136.8	133.4
Craven	299.8	144.1	71.5	166.9	259.8
Cumberland [§]	550.7	200.6	45.7	104.9	96.5
Currituck	*	*	*	131.8	*
Dare	*	*	*	61.3	*
Davidson [§]	311.1	125.4	51.9	111.6	158.3
Davie	*	*	*	69.4	*
Duplin	361.6	180.6	75.0	133.5	252.4
Durham [§]	238.3	152.3	45.1	87.0	167.3
Edgecombe	935.3	295.3	81.6	275.8	245.1
Forsyth [§]	144.5	88.1	60.0	100.0	111.7
Franklin	260.7	131.8	63.9	93.0	190.8
Gaston [§]	443.4	160.9	47.4	94.7	150.9
Gates	*	*	*	*	*
Graham	*	*	*	*	*
Granville	286.5	134.2	72.1	150.0	232.2
Greene	522.7	*	*	93.6	*
Guilford [§]	298.0	92.7	55.9	97.4	122.2

Table 3. Continued

County	Age 0-4 1999-2001	Age 5-14 1999-2001	Age 15-34 1999-2001	Age 35-64 1999-2001	Age 65+ 1999-2001
Halifax	507.8	195.6	96.8	156.1	144.6
Harnett	240.6	160.0	71.9	97.7	161.9
Haywood	446.1	150.8	67.8	116.4	140.9
Henderson	396.1	196.3	108.6	124.2	240.2
Hertford	*	*	*	272.7	206.2
Hoke	277.8	*	71.5	91.7	*
Hyde	*	*	*	302.4	1229.9
Iredell	699.6	219.2	89.1	129.9	234.5
Jackson	755.2	*	*	157.6	139.6
Johnston	327.0	149.1	70.1	150.3	247.1
Jones	*	*	*	*	*
Lee	234.5	191.0	100.0	153.1	205.2
Lenoir	920.3	500.3	152.9	183.0	181.7
Lincoln	364.6	95.4	38.9	98.7	131.7
McDowell	*	*	*	43.2	153.8
Macon	*	*	*	131.3	*
Madison	*	*	*	115.3	*
Martin	*	*	208.1	312.7	340.1
Mecklenburg [§]	358.9	146.0	52.1	125.4	207.5
Mitchell	*	*	*	*	*
Montgomery	*	*	*	87.0	*
Moore	205.4	115.4	48.8	140.9	95.6
Nash	467.4	177.9	68.8	105.2	183.8
New Hanover [§]	266.0	77.2	66.4	88.6	109.1
Northhampton	547.2	*	133.8	113.3	223.3
Onslow [§]	206.2	135.2	31.9	135.4	409.1
Orange	109.2	54.7	*	25.4	*
Pamlico	*	*	*	145.8	*
Pasquotank	925.1	327.8	71.1	328.3	606.8
Pender	279.3	*	*	85.3	178.8
Perquimans	*	*	*	151.2	332.7
Person	506.5	196.2	*	129.7	193.2
Pitt	502.5	227.6	51.5	112.1	257.0
Polk	*	*	*	*	*
Randolph	395.7	72.5	73.2	80.7	125.8
Richmond	1577.2	416.5	422.2	631.1	318.1
Robeson	885.2	285.9	141.4	331.2	449.6
Rockingham	542.6	120.6	49.5	112.6	213.8
Rowan	554.5	154.7	52.8	101.2	105.4
Rutherford	227.0	*	45.8	133.9	215.6
Sampson	260.6	137.2	110.3	146.8	172.4
Scotland	769.7	331.8	115.1	200.6	376.6

Table 3. Continued

County	Age 0-4 1999-2001	Age 5-14 1999-2001	Age 15-34 1999-2001	Age 35-64 1999-2001	Age 65+ 1999-2001
Stanly	763.8	167.8	98.8	118.9	239.9
Stokes	*	*	*	52.0	*
Surry	377.1	77.9	74.2	116.5	129.5
Swain	1168.6	*	*	*	*
Transylvania	*	*	*	*	*
Tyrrell	*	*	*	*	N/A
Union	479.6	115.8	56.6	83.5	143.0
Vance	426.3	138.4	162.0	260.1	330.4
Wake [§]	185.8	116.6	38.1	80.7	127.2
Warren	*	*	*	152.3	*
Washington	*	*	*	*	*
Watauga	428.9	*	*	72.0	313.0
Wayne	258.1	107.2	75.5	150.3	158.8
Wilkes	231.4	92.8	67.6	154.9	123.7
Wilson	393.1	165.0	94.9	191.9	374.0
Yadkin	*	*	*	86.8	175.4
Yancey	*	*	*	*	*

[§]-denotes counties considered Urban

*Rates based on less than 20 visits should be interpreted with caution.

Data Source: North Carolina State Center for Health Statistics, 1999-2001

Table 4. Hospitalization Rates (per 100,000), by Age, North Carolina Counties, 2002-2004

County	Age 0-4 2002-2004	Age 5-14 2002-2004	Age 15-34 2002-2004	Age 35-64 2002-2004	Age 65+ 2002-2004
Alamance	317.5	129.9	28.9	105.7	191.8
Alexander	471.8	*	*	81.4	*
Alleghany	*	*	*	*	*
Anson	727.9	403.9	120.4	305.5	496.9
Ashe	*	*	*	83.6	*
Avery	805.5	*	140.0	189.7	268.6
Beaufort	460.1	134.0	69.1	175.9	450.3
Bertie	564.4	*	*	158.6	217.8
Bladen	573.2	180.2	*	171.7	170.9
Brunswick	306.8	70.9	103.5	131.6	156.9
Buncombe [§]	250.5	75.0	49.5	129.5	272.6
Burke	218.1	74.9	36.2	103.4	148.7
Cabarrus	280.8	117.0	50.8	110.9	235.4

Table 4. Continued

County	Age 0-4 2002-2004	Age 5-14 2002-2004	Age 15-34 2002-2004	Age 35-64 2002-2004	Age 65+ 2002-2004
Caldwell	578.3	136.2	63.8	91.2	155.3
Camden	*	*	*	*	*
Carteret	757.5	172.7	*	107.7	177.3
Caswell	*	*	*	*	*
Catawba	244.6	76.2	*	64.4	118.2
Chatham	*	*	*	42.0	*
Cherokee	*	*	*	99.1	189.4
Chowan	*	*	*	126.8	*
Clay	*	*	N/A	*	*
Cleveland	521.8	87.3	74.2	167.6	270.4
Columbus	894.9	265.5	117.6	171.7	179.6
Craven	273.9	121.5	58.7	190.0	254.6
Cumberland [§]	589.1	204.3	49.9	118.0	146.5
Currituck	*	*	*	117.4	*
Dare	*	*	*	117.0	*
Davidson [§]	326.4	79.8	51.2	121.0	166.3
Davie	*	*	*	96.5	232.0
Duplin	460.1	159.4	52.9	96.9	201.7
Durham [§]	245.3	140.2	32.2	95.9	190.6
Edgecombe	777.5	287.4	124.4	300.0	226.3
Forsyth [§]	159.8	83.2	48.4	131.7	137.4
Franklin	380.8	150.6	52.8	115.9	292.3
Gaston [§]	463.7	145.8	41.0	114.5	211.9
Gates	*	*	*	*	*
Graham	*	*	*	*	*
Granville	364.2	105.3	*	168.5	152.7
Greene	*	*	*	160.0	*
Guilford [§]	276.1	90.0	50.9	119.0	152.5
Halifax	709.6	197.2	94.0	317.4	305.4
Harnett	383.5	143.5	68.3	161.4	194.3
Haywood	307.5	*	82.3	131.4	204.6
Henderson	184.0	111.9	72.7	136.8	311.2
Hertford	*	*	*	192.9	215.5
Hoke	347.0	119.1	*	133.9	*
Hyde	*	N/A	*	*	*
Iredell	685.7	168.7	78.8	200.1	400.2
Jackson	607.1	*	*	143.7	164.9
Johnston	277.6	109.0	65.9	205.9	236.4
Jones	*	*	*	272.0	*
Lee	208.6	151.7	68.7	195.2	195.4
Lenoir	1012.5	292.6	158.4	280.0	247.5

Table 4. Continued

County	Age 0-4 2002-2004	Age 5-14 2002-2004	Age 15-34 2002-2004	Age 35-64 2002-2004	Age 65+ 2002-2004
Lincoln	522.4	86.0	65.8	99.3	180.3
McDowell	*	*	*	58.9	150.0
Macon	*	*	*	94.2	*
Madison	*	*	*	97.3	262.3
Martin	824.5	437.8	147.4	479.1	623.2
Mecklenburg [§]	327.1	137.5	42.4	121.0	251.7
Mitchell	*	*	*	*	*
Montgomery	579.7	*	*	99.7	*
Moore	208.4	99.5	40.3	143.7	184.0
Nash	423.2	210.6	97.2	178.6	289.6
New Hanover [§]	283.8	116.6	53.9	67.7	123.1
Northhampton	*	258.4	*	153.5	211.0
Onslow [§]	329.7	121.1	38.9	158.3	282.1
Orange	163.5	68.6	28.7	36.7	84.0
Pamlico	*	*	*	134.6	*
Pasquotank	932.5	229.2	83.5	251.5	510.6
Pender	*	*	*	97.1	108.6
Perquimans	*	*	*	244.1	482.2
Person	544.8	*	*	97.0	*
Pitt	274.4	112.8	38.7	102.2	282.7
Polk	*	*	*	116.7	*
Randolph	330.4	99.8	51.7	82.9	150.1
Richmond	694.4	375.7	235.3	473.7	379.4
Robeson	873.3	195.1	123.7	417.7	708.6
Rockingham	544.1	187.4	84.8	216.6	275.4
Rowan	304.8	77.8	47.2	105.2	92.9
Rutherford	275.4	*	57.8	177.7	217.0
Sampson	320.8	148.6	87.5	210.7	125.0
Scotland	566.5	198.9	154.7	276.7	353.8
Stanly	606.2	153.7	67.4	146.3	212.8
Stokes	*	*	*	72.0	*
Surry	264.9	72.4	66.4	160.8	330.1
Swain	923.3	*	*	166.6	*
Transylvania	*	*	*	88.4	*
Tyrrell	*	*	N/A	*	*
Union	411.7	126.1	31.1	88.9	201.7
Vance	341.4	117.8	121.7	272.5	280.2
Wake [§]	190.9	121.1	34.1	78.8	170.4
Warren	*	*	*	185.0	205.2
Washington	*	*	*	247.7	*
Watauga	497.9	210.3	*	81.2	310.5

Table 4. Continued

County	Age 0-4 2002-2004	Age 5-14 2002-2004	Age 15-34 2002-2004	Age 35-64 2002-2004	Age 65+ 2002-2004
Wayne	297.4	137.5	76.8	182.4	205.9
Wilkes	328.7	107.9	75.8	144.7	217.3
Wilson	399.6	203.5	67.7	146.4	281.4
Yadkin	*	*	*	97.4	*
Yancey	*	*	*	*	*

§-denotes counties considered Urban

*Rates based on less than 20 visits should be interpreted with caution.

Data Source: North Carolina State Center for Health Statistics, 2002-2005

Table 5. Lifetime and Current Asthma Prevalence by County and Region, North Carolina, 2001-2005

(Note: Unless marked with *, prevalence is based on a numerator less than 50, interpret with caution.)

County	Lifetime/ Current Asthma Prevalence (%) 2001		Lifetime/ Current Asthma Prevalence (%) 2002		Lifetime/ Current Asthma Prevalence (%) 2003		Lifetime/ Current Asthma Prevalence (%) 2004		Lifetime/ Current Asthma Prevalence (%) 2005	
Alamance	•	•	•	•	•	•	14.3*	8.8	9.6	4.8
Alexander (w/ Burke, Caldwell, Cleveland, Lincoln)	•	•	•	•	•	•	•	•	10.2*	5.7
Alleghany* (w/ Wilkes)	•	•	•	•	6.7	4.2	•	•	8.2 ^j	3.5 ^j
Anson (w/ Hoke, Montgomery, Richmond, Scotland, Stanly)	•	•	•	•	•	•	•	•	13.7*	8.9
Ashe* (w/ Wilkes)	•	•	•	•	6.7	4.2	•	•	8.2 ^j	3.5 ^j
Avery	•	•	•	•	•	•	•	•	8.2 ^j	3.5 ^j
Bladen (w/ Columbus & Sampson)	•	•	•	•	12.8*	7.8	•	•	10.1 ^c	6.6 ^c
Brunswick (w/ Bladen, Columbus, Pender)	•	•	•	•	•	•	•	•	10.1	6.6
Buncombe [§]	11.2	6.5	13.4*	7.3	14.2*	7	16.3*	8.5	14.9*	10.0*
Burke (w/ Alexander, Caldwell, Cleveland, Lincoln)	•	•	•	•	•	•	•	•	10.2*	5.7

Table 5. Continued

County	Lifetime/ Current Asthma Prevalence (%) 2001		Lifetime/ Current Asthma Prevalence (%) 2002		Lifetime/ Current Asthma Prevalence (%) 2003		Lifetime/ Current Asthma Prevalence (%) 2004		Lifetime/ Current Asthma Prevalence (%) 2005	
Cabarrus	•	•	•	•	•	•	11.2	6	12.7*	8.5
Caldwell (w/ Alexander, Burke, Cleveland, Lincoln)	•	•	•	•	•	•	•	•	10.2*	5.7
Carteret (w/ Currituck, Craven, Dare, Hyde, & Pamlico)	•	•	•	•	•	•	10.3	6.9	9.2	7.2
Caswell (w/ Granville, Person, Vance)	•	•	•	•	•	•	•	•	11.5*	8.7
Catawba	•	•	•	•	•	•	9.5	5.6	10.7*	8.0
Chatham (w/ Lee)	•	•	•	•	6.7	4.3	•	•	7.3 ^g *	3.9 ^g
Cleveland (w/ Alexander, Burke, Caldwell, Lincoln)	•	•	•	•	•	•	•	•	10.2	5.7
Columbus (w/ Bladen & Sampson)	•	•	•	•	12.8*	7.8	•	•	10.1 ^c	6.6 ^c
Craven (w/ Pamlico)	•	•	•	•	13.6*	10.3	10.3 ^b	6.9 ^b	9.2 ^b	7.2 ^b
Cumberland [§]	7.5	4.5	•	•	•	•	14.7*	10.2	9.7	7.9
Currituck (w/ Carteret, Craven, Dare, Hyde, Pamlico)	•	•	•	•	•	•	10.3	6.9	9.2	7.2
Dare (w/ Carteret, Currituck, Craven, Dare, Hyde, Pamlico)	•	•	•	•	•	•	10.3	6.9	9.2	7.2
Davidson [§]	•	•	•	•	•	•	12.1	7.8	7.6	4.0
Davie (w/ Rockingham, Stokes, Surry, Yadkin)	•	•	•	•	•	•	•	•	7.1	5.1
Duplin (w/ Greene, Harnett, Jones, Lenoir, Sampson, Wayne)	•	•	•	•	•	•	•	•	9.0	7.1
Durham [§]	10.8	6.8	•	•	•	•	13*	5.4	9.7*	6.5

Table 5. Continued

County	Lifetime/ Current Asthma Prevalence (%) 2001		Lifetime/ Current Asthma Prevalence (%) 2002		Lifetime/ Current Asthma Prevalence (%) 2003		Lifetime/ Current Asthma Prevalence (%) 2004		Lifetime/ Current Asthma Prevalence (%) 2005	
Forsyth [§]	12.6*	8	7.7*	5	•	•	10.5	5.7	9.0*	4.4
Franklin (w/ Granville & Vance)	•	•	•	•	8.3*	5.8	14 ^c	10.1 ^c	8.4 ^c	5.6 ^c
Gaston [§]	6.8	5.4	•	•	•	•	14.2	9.4	13.4*	7.4
Graham (w/ Jackson & Swain)	•	•	•	•	12*	6.2	•	•	•	•
Granville (w/ Franklin & Vance)	•	•	•	•	8.3*	5.8	•	•	11.5 ^{f*}	8.7 ^f
Greene (w/ Duplin, Harnett, Jones, Lenoir, Sampson, Wayne)	•	•	•	•	•	•	•	•	9.0	7.1
Guilford [§]	10.2	5.9	12.8*	5.9	13.6*	7.9	11*	6.3	11.2*	8.5
Harnett (w/ Duplin, Greene, Jones, Lenoir, Sampson, Wayne)	•	•	•	•	•	•	•	•	9.0	7.1
Henderson (w/ Transylvania)	•	•	8.8*	4.2	•	•	•	•	•	•
Hoke (w/ Robeson & Scotland)	•	•	•	•	9.5*	7.5	•	•	13.7 ^{h*}	8.9 ^h
Hyde (w/ Carteret, Currituck, Craven, Dare, Hyde, & Pamlico)	•	•	•	•	•	•	10.3	6.9	9.2	7.2
Iredell	•	•	•	•	•	•	11.8	6.9	9.3	5.3
Jackson (w/ Graham & Swain)	•	•	•	•	12*	6.2	•	•	•	•
Johnston	•	•	•	•	•	•	11.3*	7.7	10.7	6.1
Jones (w/ Duplin, Greene, Harnett, Lenoir, Sampson, Wayne)									9.0	7.1
Lee (w/ Chatham)	•	•	•	•	6.7	4.3	•	•	7.3 ^g	3.9 ^g
Lenoir (w/ Duplin, Greene, Harnett, Jones, Sampson, Wayne)	•	•	•	•	•	•	•	•	9.0	7.1
Lincoln (w/ Alexander, Burke, Caldwell, Cleveland)	•	•	•	•	•	•	•	•	10.2*	5.7

Table 5. Continued

County	Lifetime/ Current Asthma Prevalence (%) 2001		Lifetime/ Current Asthma Prevalence (%) 2002		Lifetime/ Current Asthma Prevalence (%) 2003		Lifetime/ Current Asthma Prevalence (%) 2004		Lifetime/ Current Asthma Prevalence (%) 2005	
Mecklenburg [§]	7.2	5.3	10.6*	5.5	6.8	3.5	12.3*	6.6	11.7*	6.9*
Montgomery (w/ Anson, Hoke, Richmond, Scotland, Stanly)	•	•	•	•	•	•	•	•	13.7*	8.9
Moore (w/ Chatham and Lee)	•	•	•	•	•	•	•	•	7.3	3.9
Nash (w/ Wilson)	•	•	•	•	12.2	7.3	14 ^c	10.1 ^c	8.4 ^c	5.6 ^c
New Hanover [§]	9.7	6.4	•	•	•	•	11.4	5.2	10.4	4.8
Onslow [§]	10.1	5.5	•	•	•	•	12.7*	7.8	12.4*	5.3
Orange	•	•	10.9*	5.6	15.3	8.9	13.8*	9.5	8.2	5.2
Pamlico (w/ Craven)	•	•	•	•	13.6*	10.3	10.3 ^b	6.9 ^b	9.2 ^b	7.2 ^b
Pender (w/ Bladen, Brunswick, Columbus)	•	•	•	•	•	•	•	•	10.1	6.6
Person (w/ Caswell, Granville, Vance)	•	•	•	•	•	•	•	•	11.5*	8.7
Pitt	•	•	9.7	4.8	•	•	9.4	6	9.6	5.2
Randolph	•	•	10.1	5.6	•	•	12.2	8.7	11.4*	6.1
Richmond (w/ Anson, Hoke, Montgomery, Scotland, Stanly)	•	•	•	•	•	•	•	•	13.7	8.9
Robeson	•	•	12.3*	7.5	9.5 ^a *	7.5 ^a	16.9*	11.1	11.1*	6.9
Rockingham (w/ Davie, Stokes, Surry, Yadkin)	•	•	•	•	•	•	•	•	7.1	5.1
Rowan	•	•	•	•	•	•	13.4*	9.2	12.0	9.5
Sampson (w/ Bladen & Columbus)	•	•	•	•	12.8*	7.8	•	•	9.0 ^d	7.1 ^d
Scotland (w/ Hoke & Robeson)	•	•	•	•	9.5*	7.5	•	•	13.7 ^h *	8.9 ^h

County	Lifetime/ Current Asthma Prevalence (%) 2001		Lifetime/ Current Asthma Prevalence (%) 2002		Lifetime/ Current Asthma Prevalence (%) 2003		Lifetime/ Current Asthma Prevalence (%) 2004		Lifetime/ Current Asthma Prevalence (%) 2005	
Stanly (w/ Anson, Hoke, Montgomery, Richmond, Scotland)	•	•	•	•	•	•	•	•	13.7*	8.9
Stokes (w/ Surry & Yadkin)	•	•	•	•	12.6*	6.6	•	•	7.1 ⁱ	5.1 ⁱ
Surry (w/ Stokes & Yadkin)	•	•	•	•	12.6*	6.6	•	•	7.1 ⁱ	5.1 ⁱ
Swain (w/ Graham & Jackson)	•	•	•	•	12	6.2	•	•	•	•
Transylvania (w/ Henderson)	•	•	8.8*	4.2	•	•	•	•	•	•
Union	•	•	•	•	•	•	14.7*	9.8	11.2	5.0
Vance (w/ Franklin & Granville)	•	•	•	•	8.3*	5.8	•	•	11.5 ^f *	8.7 ^f
Wake [§]	9.1	6.5	10.8	4.7	9.4	6	11.2*	6.6	7.6*	5.2*
Watauga* (w/ Wilkes)	•	•	•	•	6.7	4.2	•	•	8.2 ^j	3.5 ^j
Wayne (w/ Duplin, Greene, Harnett, Jones, Lenoir, Sampson)	•	•	•	•	•	•	•	•	9.0	7.1
Wilkes (w/ Appalachian)	•	•	•	•	6.7	4.2	•	•	8.2 ^j	3.5 ^j
Wilson (w/ Nash)	•	•	•	•	12.2	7.3	14 ^c	10.1 ^c	8.4 ^c	5.6 ^c
Yadkin (w/ Stokes & Surry)	•	•	•	•	12.6*	6.6	•	•	7.1 ⁱ	5.1 ⁱ

*Appalachian Health District includes Alleghany, Ashe, and Watauga counties.

^a2003 Robeson prevalence calculated with Hoke and Scotland counties.

^b2004, 2005 Craven and Pamlico prevalence calculated with Carteret, Currituck, Dare, and Hyde.

^c2004, 2005 Franklin, Nash, and Wilson prevalence are calculated together.

^d2005 Sampson prevalence calculated with Duplin, Greene, Harnett, Jones, Lenoir, Sampson, and Wayne.

^e2005 Bladen and Columbus prevalence calculated with Brunswick and Pender.

^f2005 Caswell, Granville, Person, and Vance were calculated together

^g2005 Chatham, Lee, and Moore were calculated together

^h2005 Anson, Hoke, Montgomery, Richmond, Scotland, and Stanly were calculated together

ⁱ2005 Davie, Rockingham, Stokes, Surry, and Yadkin were calculated together.

^j2005 Appalachian Health District (Alleghany, Ashe, Watauga) were calculated with Avery and Wilkes.

•Data unavailable

Data Source: BRFSS, North Carolina, 2001-2005

The following counties are not included in this table because they have no specific asthma

prevalence data over the past 5 years: Beaufort, Bertie, Camden, Cherokee, Chowan, Clay, Edgecombe, Gates, Halifax, Henderson, Hertford, Macon, Madison, Martin, McDowell, Mitchell, Northhampton, Pasquotank, Perquimans, Polk, Rutherford, Tyrell, Warren, Washington, Yancy.

The BRFSS has used 37 different geographical strata since 2004. 22 of these strata are single counties which have the largest N.C. populations. This design allows for county level estimates on these 22 over sampled counties. The remaining 78 counties were grouped into 13 clusters of multi-county groups. The two primary factors used to determine these groups were population size and geographic contiguity. In some cases, counties that share health information were grouped together like the Mountain AHEC, for example. Other counties were grouped using cluster analysis. The remaining two strata were formed from 2 census tracts that contained a high proportion of American Indian households in order to allow for over sampling of American Indian populations in order to have a more representative sample.

Appendix E:
Regional Specific Data



Appendix E. Regional Specific Data[§]

Table 1. Mortality Rates (per 1,000,000) Due to Asthma as a Primary Cause of Death, by Region, North Carolina, 1999 – 2004

Rate	2000	2001	2002	2003	2004	Total*
Eastern	19.6	22.8	18.4	15.4	19.1	96.5
Piedmont	13.2	11.9	9.4	13.4	11.2	58.9
Western	20.5	24.9	18.4	17.3	9.1	90.5

*2000-2004 combined

Data Source: North Carolina State Center for Health Statistics Detailed Mortality Statistics, 1999-2004

Table 2. Lifetime and Current Asthma Prevalence, by Region, North Carolina, 2001-2005

Region	Lifetime/ Current Asthma Prevalence (%) 2001		Lifetime/ Current Asthma Prevalence (%) 2002		Lifetime/ Current Asthma Prevalence (%) 2003		Lifetime/ Current Asthma Prevalence (%) 2004		Lifetime/ Current Asthma Prevalence (%) 2005	
Eastern	11.5	7.2	10.4	6.8	12.2	8.3	13.3	8.1	9.6	6.4
Piedmont	10.8	6.9	11.8	7.6	10.6	6.3	11.9	7	10.0	6.3
Western	8.3	4.9*	9.9	6*	12.4	7.9	15.5	8.6	11.3	7.3

*Prevalence based on a numerator less than 50, interpret with caution

Data Source: BRFSS, North Carolina, 2001-2005

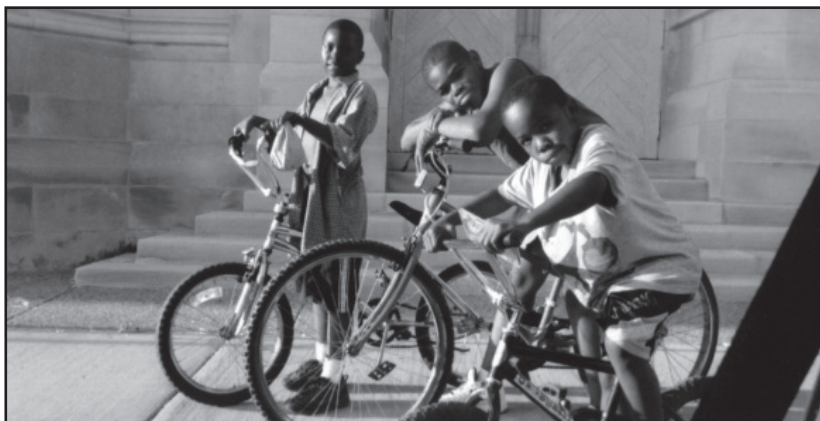
§Note: The three regions include the following counties:

Eastern: Beaufort, Bertie, Bladen, Brunswick, Camden, Carteret, Chowan, Columbus, Craven, Cumberland, Currituck, Dare, Duplin, Edgecombe, Gates, Greene, Halifax, Harnett, Hertford, Hoke, Hyde, Johnston, Jones, Lenoir, Martin, Nash, New Handover, Northampton, Onslow, Pamlico, Pasquotank, Pender, Perquimans, Pitt, Robeson, Sampson, Scotland, Tyrell, Washington, Wayne, and Wilson

Piedmont: Alamance, Alexander Anson, Cabarrus, Caswell, Catawba, Chatham, Cleveland, Davidson, Davie, Durham, Forsyth, Franklin, Gaston, Granville, Guilford, Iredell, Lee, Lincoln, Mecklenburg, Montgomery, Moore, Orange, Person, Randolph, Richmond, Rockingham, Rowan, Stanly, Stokes, Union, Vance, Wake, Warren, and Yadkin.

Western: Alleghany, Ashe, Avery, Buncombe, Burke, Caldwell, Cherokee, Clay, Graham, Haywood, Henderson, Jackson, McDowell, Macon, Madison, Mitchell, Polk, Rutherford, Surry, Swain, Transylvania, Watauga, Wilkes, and Yancey.

Appendix F:
Youth Risk Behavior Survey – YRBS



APPENDIX F. Youth Risk Behavior Survey – YRBS

Middle School

Due to the fact that the 60% combined student and school participation response rates were not met for middle school in North Carolina (response rate was 58%), the data was not weighted, and therefore 95% confidence intervals were not provided.

Table 1. Lifetime Asthma Prevalence Among Middle School Students by Age, Grade, Race, and Sex, North Carolina, YRBS¹, 2005

	Total Percent (Count)	Males Percent (Count)	Females Percent (Count)
Total	18.6% (3,482)	19.4% (1669)	17.7% (1806)
AGE			
Age ≤ 11	17.8% (382)	21.4% (145)	14.9% (235)
Age 12	16.6% (957)	18% (434)	15.5% (523)
Age 13	19% (1,145)	19.9% (528)	18.3% (616)
Age ≥ 14	20.5% (995)	19.6% (561)	21.1% (431)
GRADE			
6 th Grade	18.2% (1,007)	20% (451)	16.3% (553)
7 th Grade	18.6% (1,168)	20.8% (558)	16.6% (609)
8 th Grade	19% (1,271)	17.8% (640)	20.1% (631)
RACE/ETHNICITY			
African American	21.8% (789)	23.0% (387)	20.5% (400)
Hispanic/Latino	13.7% (249)	16.2% (117)	10.7% (131)
White	18% (1,979)	18.5% (962)	17.4% (1,016)
All Other Races	16.7% (252)	14.8% (108)	16.9% (142)
Multiple Races	20.6% (199)	*	19.3% (109)

¹Data is unweighted due to the fact that the 60% combined student and school participation response rates were not met.

*fewer than 100 cases

Data Source: YRBS, North Carolina, 2005

Table 2. Current Asthma Prevalence Among Middle School Students by Age, Grade, Race, and Sex, North Carolina, YRBS¹, 2005

	Total Percent (Count)	Males Percent (Count)	Females Percent (Count)
Total	15.2% (3,455)	15.2% (1,654)	15.1% (1,794)
AGE			
Age ≤ 11	13.6% (382)	17.2% (145)	10.6% (235)
Age 12	14.1% (945)	14.5% (429)	13.8% (516)
Age 13	15.4% (1,138)	14.9% (524)	15.8% (613)
Age ≥ 14	16.7% (987)	15.7% (555)	17.9% (429)
GRADE			
6 th Grade	14.4% (999)	16% (449)	12.8% (547)
7 th Grade	15% (1,155)	15.3% (550)	14.7% (604)
8 th Grade	16% (1,266)	14.6% (636)	17.5% (630)
RACE/ETHNICITY			
African American	17.8% (782)	17.2% (383)	18.1% (397)
Hispanic/Latino	10.6% (245)	13% (115)	8.5% (129)
White	14.9% (1,966)	14.5% (956)	15.3% (1,009)
All Other Races	13.9% (251)	13.1% (107)	13.4% (142)
Multiple Races	14.7% (197)	*	11.9% (109)

¹Data is unweighted due to the fact that the 60% combined student and school participation response rates were not met

*Fewer than 100 cases

Data Source: YRBS, North Carolina, 2005

YRBS By Region

The following YRBS tables (3, 4, 5, 6) are regional numbers for the eastern, piedmont, and western regions of the state. The regions that the YRBS uses are slightly different from the regions shown in the regional specific data section of Appendix E. The regions are shown at the end of this section.

Table 3. Lifetime Asthma Prevalence for Middle Students, by Region^{1,2}, North Carolina, 2005

	Total Percent (95% CI)	Males Percent (95% CI)	Females Percent (95% CI)
Eastern Region			
Total	19.4% (16.6,22.2)	18.8% (14.8, 22.7)	19.8% (16.2, 23.4)
AGE			
Age ≤ 11	17.4% (7.8, 27.0)	*	*
Age 12	16.1% (11.9, 20.4)	16.4% (9.5, 23.3)	15.8% (10.9, 20.8)
Age 13	21.1% (17.4, 24.8)	20.2% (15.1, 25.4)	22.1% (16.5, 27.7)
Age ≥ 14	21.8% (18.0, 25.6)	19.0% (14.9, 23.0)	25.2% (18.1, 32.3)
GRADE			
6 th Grade	18.7% (13.7, 23.7)	19.7% (11.2, 28.2)	16.7% (11.4, 21.9)
7 th Grade	19.4% (15.2, 23.5)	19.7% (14.2, 25.2)	19.1% (13.8, 24.5)
8 th Grade	20.5% (16.0, 25.0)	17.7% (12.3, 23.2)	23.4% (15.5, 31.2)
RACE/ETHNICITY			
African American	21.7% (17.4, 26.0)	23.5% (16.9, 30.1)	19.5% (13.6, 25.4)
Hispanic/Latino	10.0% (5.2, 14.7)	*	*
White	18.4% (14.6, 22.1)	16.5% (11.6, 21.4)	20.6% (16.1, 25.1)
All Other Races	*	*	*
Multiple Races	*	*	*
Central (Piedmont) Region			
Total	16.5%	19.0%	13.8%
AGE			
Age ≤ 11	*	*	*
Age 12	14.6%	18.0%	11.9%
Age 13	15.7%	16.7%	14.8%
Age ≥ 14	20.3%	23.6%	*
GRADE			
6 th Grade	13.0%	15.7%	9.2%
7 th Grade	19.1%	23.5%	15.1%
8 th Grade	17.3%	17.7%	17.0%
RACE/ETHNICITY			
African American	18.6%	19.4%	17.6%
Hispanic/Latino	*	*	*
White	17.5%	21.6%	13.8%
All Other Races	14.7%	*	*
Multiple Races	*	*	*

Table 3. Continued

	Total Percent (95% CI)	Males Percent (95% CI)	Females Percent (95% CI)
Western Region			
Total	18.9% (15.5, 22.3)	20.7% (16.6, 24.8)	16.9% (12.8, 21.0)
AGE			
Age ≤ 11	22.3% (17.0, 27.7)	*	17.7% (8.7, 26.7)
Age 12	17.6% (11.3, 23.9)	18.8% (12.7, 24.9)	16.4% (7.4, 25.4)
Age 13	18.8% (14.9, 22.7)	20.1% (13.8, 26.4)	17.7% (12.3, 23.2)
Age ≥ 14	18.9% (13.8, 24.0)	20.9% (12.5, 29.2)	15.7% (10.2, 21.2)
GRADE			
6 th Grade	22.4% (16.1, 28.6)	23.7% (17.7, 29.8)	21.0% (13.0, 29.1)
7 th Grade	16.7% (12.2, 21.1)	19.4% (12.0, 26.8)	13.8% (9.4, 18.3)
8 th Grade	18.0% (14.1, 21.9)	19.3% (13.2, 25.4)	16.7% (12.0, 21.4)
RACE/ETHNICITY			
African American	*	*	*
Hispanic/Latino	*	*	*
White	17.7% (13.4, 22.0)	19.3% (14.1, 24.4)	16.0% (11.6, 20.4)
All Other Races	*	*	*
Multiple Races	*	*	*

¹Department of Public Instructions regions differ slightly in their designation from the other regions displayed in this report.

²Eastern and Western regions had enough responses to weight the data, the Central (Piedmont) region did not, so the data is unweighted (therefore, no 95% confidence intervals are available).

Data Source: YRBS, North Carolina, 2005

Table 4. Lifetime Asthma Prevalence for High School Students, by Region^{1,2}, North Carolina, 2005

	Total Percent (95% CI)	Males Percent (95% CI)	Females Percent (95% CI)
Eastern Region			
Total	18.0% (15.2, 20.9)	18.6% (14.9, 22.2)	17.4% (14.4, 20.3)
AGE			
Age ≤ 15	17.6% (15.1, 20.0)	18.0% (14.5, 21.5)	17.9% (13.6, 20.8)
Age 16 or 17	17.5% (14.0, 21.0)	19.1% (15.8, 22.4)	15.9% (10.2, 21.6)
Age ≥ 18	20.7% (9.2, 32.2)	*	*
GRADE			
9 th Grade	17.5% (14.2, 20.8)	19.0% (14.5, 23.5)	16.0% (11.2, 20.8)
10 th Grade	18.0% (13.2, 22.8)	19.1% (13.2, 25.0)	16.8% (11.3, 22.3)
11 th Grade	17.5% (12.3, 22.7)	17.2% (11.0, 23.4)	17.1% (10.6, 23.6)
12 th Grade	19.1% (10.4, 27.8)	*	*
RACE/ETHNICITY			
African American	22.1% (18.8, 25.3)	24.0% (18.3, 29.8)	20.0% (16.1, 23.8)
Hispanic/Latino	*	*	*
White	15.7% (12.5, 18.8)	15.6% (11.4, 19.7)	15.8% (11.6, 20.0)
All Other Races	*	*	*
Multiple Races	*	*	*

Table 4. Continued

	Total Percent (95% CI)	Males Percent (95% CI)	Females Percent (95% CI)
Central (Piedmont) Region			
Total	21.0% (17.8, 24.1)	23.3% (19.4, 27.2)	18.8% (14.9, 22.7)
AGE			
Age ≤ 15	21.2% (16.0, 26.4)	27.5% (19.2, 35.9)	15.7% (11.5, 20.0)
Age 16 or 17	21.5% (19.0, 24.1)	22.7% (18.6, 26.8)	20.4% (15.8, 25.0)
Age ≥ 18	18.0% (4.9, 31.1)	*	*
GRADE			
9 th Grade	22.2% (18.5, 25.9)	27.1% (19.3, 34.9)	17.2% (10.8, 23.5)
10 th Grade	20.9% (14.1, 27.7)	27.4% (19.6, 35.2)	14.4% (8.5, 20.3)
11 th Grade	19.8% (14.1, 25.5)	21.6% (16.6, 26.7)	18.5% (9.9, 27.1)
12 th Grade	19.4% (9.9, 29.0)	*	*
RACE/ETHNICITY			
African American	31.4% (22.1, 40.8)	35.2% (22.8, 47.6)	28.5% (17.7, 39.3)
Hispanic/Latino	17.9% (11.2, 24.5)	*	*
White	15.3% (12.4, 18.1)	16.8% (13.2, 20.5)	13.8% (10.1, 17.5)
All Other Races	*	*	*
Multiple Races	*	*	*
Western Region			
Total	19.6% (17.6, 21.7)	20.3% (17.6, 23.0)	18.7% (15.5, 22.0)
AGE			
Age ≤ 15	21.0% (18.2, 23.8)	22.2% (18.5, 26.0)	19.3% (15.0, 23.6)
Age 16 or 17	19.4% (16.0, 22.8)	19.8% (15.5, 24.2)	19.0% (14.1, 23.9)
Age ≥ 18	16.5% (10.8, 22.1)	*	*
GRADE			
9 th Grade	19.7% (17.0, 22.4)	19.6% (16.2, 22.9)	19.8% (14.2, 25.4)
10 th Grade	20.6% (16.5, 24.8)	22.2% (16.1, 28.3)	19.1% (13.5, 24.6)
11 th Grade	17.1% (12.4, 21.8)	20.3% (13.0, 27.6)	13.9% (7.8, 20.0)
12 th Grade	20.3% (14.9, 25.6)	18.6% (10.4, 26.7)	21.9% (14.1, 29.7)
RACE/ETHNICITY			
African American	21.5% (15.1, 28.0)	*	*
Hispanic/Latino	*	*	*
White	19.5% (17.1, 21.9)	20.0% (17.1, 22.9)	18.7% (15.2, 22.3)
All Other Races	*	*	*
Multiple Races	*	*	*

¹Data is weighted

*Fewer than 100 cases

Data Source: YRBS, North Carolina, 2005

Table 5. Current Asthma Prevalence for Middle Students, by Region^{1,2}, North Carolina, 2005

	Total Percent (95% CI)	Males Percent (95% CI)	Females Percent (95% CI)
Eastern Region			
Total	15.9% (13.5, 18.3)	14.7% (11.3, 18.2)	16.8% (14.0, 19.7)
AGE			
Age ≤ 11	15.2% (6.8, 23.6)	*	*
Age 12	14.6% (10.4, 18.9)	13.9% (7.7, 20.1)	15.5% (10.5, 20.5)
Age 13	15.9% (12.4, 19.5)	14.0% (10.0, 17.9)	17.9% (13.2, 22.5)
Age ≥ 14	17.6% (13.3, 21.8)	15.4% (10.5, 20.3)	20.1% (14.3, 25.9)
GRADE			
6 th Grade	15.7% (11.4, 20.1)	15.9% (8.7, 23.1)	14.6% (9.4, 19.8)
7 th Grade	15.0% (11.4, 18.5)	14.0% (10.2, 17.8)	16.0% (10.6, 21.5)
8 th Grade	17.3% (12.9, 21.8)	14.8% (9.4, 20.2)	19.9% (13.6, 26.2)
RACE/ETHNICITY			
African American	17.8% (14.2, 21.4)	17.5% (12.0, 22.9)	17.5% (12.4, 22.6)
Hispanic/Latino	8.3% (4.5, 12.1)	*	*
White	15.4% (12.2, 18.6)	13.3% (9.3, 17.4)	17.9% (14.4, 21.4)
All Other Races	*	*	*
Multiple Races	*	*	*
Central (Piedmont) Region			
Total	13.6%	14.6%	12.5%
AGE			
Age ≤ 11	*	*	*
Age 12	13.5%	16.2%	11.2%
Age 13	13.6%	13.5%	13.6%
Age ≥ 14	16.1%	16.9%	*
GRADE			
6 th Grade	10.0%	12.6%	7.1%
7 th Grade	15.8%	17.9%	13.9%
8 th Grade	15.0%	13.6%	16.3%
RACE/ETHNICITY			
African American	15.5%	14.0%	17.0%
Hispanic/Latino	*	*	*
White	13.9%	16.1%	11.9%
All Other Races	13.8%	*	*
Multiple Races	*	*	*

Table 5. Continued

Western Region			
Total	15.6% (12.7, 18.5)	16.3% (12.7, 19.9)	14.9% (11.2, 18.6)
AGE			
Age ≤ 11	18.9% (14.8, 23.0)	*	13.2% (5.0, 21.3)
Age 12	14.0% (8.4, 19.5)	14.4% (8.7, 20.1)	13.5% (6.1, 21.0)
Age 13	15.2% (11.6, 18.7)	13.9% (8.2, 19.6)	16.2% (11.5, 20.9)
Age ≥ 14	16.4% (11.8, 21.0)	17.4% (10.3, 24.5)	15.2% (9.8, 20.6)
GRADE			
6 th Grade	18.0% (12.7, 23.4)	19.8% (14.2, 25.4)	16.3% (10.0, 22.7)
7 th Grade	13.3% (9.9, 16.7)	13.4% (9.0, 17.7)	13.2% (8.6, 17.8)
8 th Grade	15.9% (12.3, 19.6)	16.4% (10.8, 22.0)	15.5% (10.9, 20.0)
RACE/ETHNICITY			
African American	*	*	*
Hispanic/Latino	*	*	*
White	14.9% (11.2, 18.5)	15.2% (11.0, 19.3)	14.6% (10.3, 18.8)
All Other Races	*	*	*
Multiple Races	*	*	*

*Eastern and Western regions had enough responses to weight the data, the Central (Piedmont) region did not, and the data is unweighted (therefore, no 95% confidence intervals are available).
Data Source: YRBS, North Carolina, 2005

Table 6. Current Asthma Prevalence for High School Students, by Region^{1,2}, North Carolina, 2005

	Total Percent (Count)	Males Percent (Count)	Females Percent (Count)
Eastern Region			
Total	14.2% (11.7, 16.7)	13.0% (9.1, 16.8)	15.2% (12.6, 17.8)
AGE			
Age ≤ 15	14.6% (11.9, 17.3)	13.6% (10.4, 16.9)	15.6% (11.9, 19.3)
Age 16 or 17	13.1% (10.1, 16.0)	12.2% (8.1, 16.3)	13.9% (8.6, 19.2)
Age ≥ 18	16.2% (7.6, 24.9)	*	*
GRADE			
9 th Grade	14.0% (10.5, 17.4)	13.5% (9.4, 17.5)	14.6% (9.9, 19.3)
10 th Grade	14.0% (9.9, 18.1)	12.8% (7.9, 17.7)	15.2% (9.7, 20.7)
11 th Grade	13.1% (9.1, 17.0)	11.3% (6.6, 16.0)	13.9% (8.9, 19.0)
12 th Grade	15.6% (7.9, 23.3)	*	*
RACE/ETHNICITY			
African American	16.1% (13.7, 18.5)	14.8% (9.4, 20.1)	16.8% (13.1, 20.4)
Hispanic/Latino	*	*	*
White	13.4% (10.1, 16.7)	12.0% (7.2, 16.9)	14.8% (10.5, 19.2)
All Other Races	*	*	*
Multiple Races	*	*	*

Table 6. Continued

Central (Piedmont) Region			
Total	17.1% (14.8, 19.3)	17.4% (13.9, 21.0)	17.0% (13.5, 20.5)
AGE			
Age ≤ 15	17.9% (13.6, 22.1)	20.8% (13.6, 28.0)	15.5% (11.1, 20.0)
Age 16 or 17	17.2% (14.1, 20.2)	16.8% (13.6, 20.1)	17.6% (12.2, 23.0)
Age ≥ 18	14.4% (5.7, 23.1)	*	*
GRADE			
9 th Grade	18.9% (15.6, 22.3)	20.7% (13.4, 28.0)	17.1% (10.6, 23.6)
10 th Grade	16.8% (11.6, 22.0)	20.7% (14.7, 26.6)	13.1% (7.9, 18.3)
11 th Grade	16.3% (10.5, 22.2)	15.7% (9.8, 21.6)	17.3% (9.3, 25.2)
12 th Grade	15.2% (8.8, 21.5)	*	*
RACE/ETHNICITY			
African American	26.8% (19.6, 34.1)	26.8% (15.2, 38.4)	27.2% (18.5)
Hispanic/Latino	9.9% (2.9, 16.9)	*	*
White	12.9% (10.3, 15.4)	13.2% (9.4, 17.0)	12.6% (9.3, 15.8)
All Other Races	*	*	*
Multiple Races	*	*	*
Western Region			
Total	17.2% (15.0, 19.3)	17.3% (14.6, 20.0)	16.9% (13.7, 20.1)
AGE			
Age ≤ 15	18.1% (15.1, 21.1)	18.8% (14.7, 23.0)	16.9% (12.8, 21.0)
Age 16 or 17	17.2% (13.8, 20.6)	16.9% (13.0, 20.9)	17.4% (12.4, 22.4)
Age ≥ 18	14.7% (9.4, 19.9)	*	*
GRADE			
9 th Grade	16.8% (13.8, 19.8)	16.6% (12.7, 20.4)	17.1% (11.8, 22.4)
10 th Grade	18.0% (13.7, 22.3)	18.4% (12.5, 24.4)	17.5% (12.0, 23.0)
11 th Grade	14.8% (10.2, 19.4)	17.9% (10.9, 24.9)	11.8% (5.4, 18.2)
12 th Grade	18.5% (13.4, 23.6)	15.7% (8.0, 23.4)	21.2% (13.3, 29.0)
RACE/ETHNICITY			
African American	18.5% (11.8, 25.1)	*	*
Hispanic/Latino	*	*	*
White	17.0% (14.5, 19.4)	17.0% (14.2, 19.9)	16.7% (13.2, 20.2)
All Other Races	*	*	*
Multiple Races	*	*	*

* Data is weighted

* Fewer than 100 cases

Data Source: YRBS, North Carolina, 2005

Table 7. High School Students with Current Asthma who had an Episode of Asthma or an Asthma Attack During the past 12 Months, By Region, YRBS¹, 2005

	Eastern Region Percent (95% CI)	Central (Piedmont) Region Percent (95% CI)	Western Region Percent (95% CI)
Total	34.0% (27.3, 40.8)	30.0% (24.3, 35.8)	32.9% (27.3, 38.4)

¹Data is weighted

Data Source: YRBS, North Carolina, 2005

Note: The three YRBS regions include the following counties:

Eastern: Beaufort, Bertie, Bladen, Brunswick, Camden, Carteret, Chowan, Columbus, Craven, Currituck, Dare, Duplin, Edgecombe, Gates, Greene, Halifax, Hertford, Hyde, Johnston, Jones, Lenoir, Martin, Nash, New Handover, Northampton, Onslow, Pamlico, Pasquotank, Pender, Perquimans, Pitt, Sampson, Tyrell, Warren, Washington, Wayne, and Wilson

Piedmont: Alamance, Anson, Cabarrus, Caswell, , Chatham, Cumberland, Davidson, Davie, Durham, Forsyth, Franklin, Gaston, Granville, Guilford, Harnett, Hoke, Iredell, Lee, Lincoln, Mecklenburg, Montgomery, Moore, Orange, Person, Randolph, Richmond, Robeson, Rockingham, Rowan, Scotland, Stanly, Stokes, Surry, Union, Vance, Wake, and Yadkin.

Western: Alleghany, Alexander, Ashe, Avery, Buncombe, Burke, Caldwell, Catawba, Cherokee, Clay, Cleveland, Graham, Haywood, Henderson, Jackson, McDowell, Macon, Madison, Mitchell, Polk, Rutherford, Swain, Transylvania, Watauga, Wilkes, and Yancey.

Appendix G:

***North Carolina Annual School Health
Services Report For Public Schools:
Summary Report of School Nursing Services***



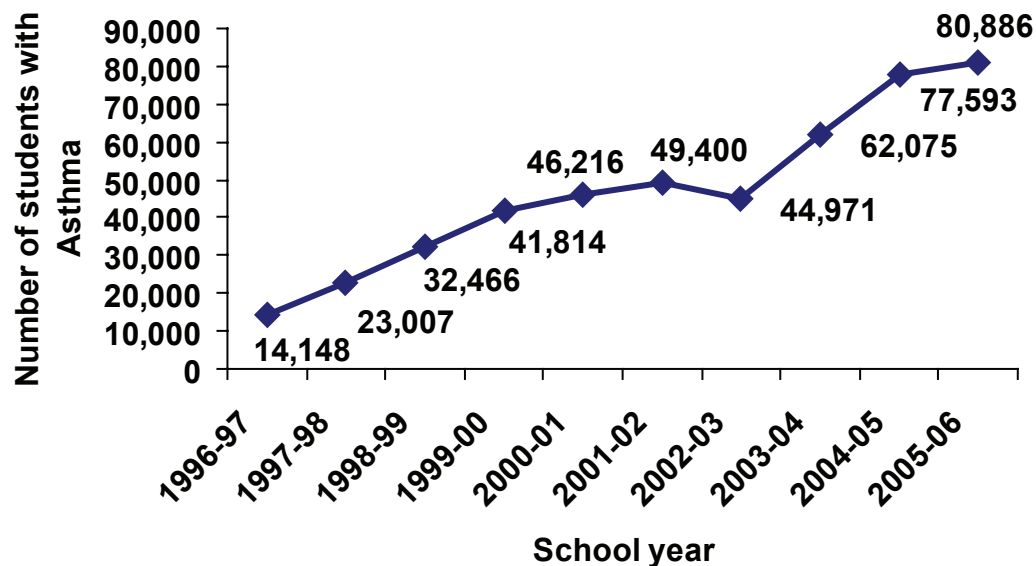
Appendix G. North Carolina Annual School Health Services Report For Public Schools: Summary Report of School Nursing Services

Another survey looking at asthma in school children is the North Carolina Annual School Health Services Report for Public schools. The Annual School Health services report includes data submitted by school nurses, based on their knowledge of health services provided by school nurses and other health professionals in their schools from North Carolina Public Schools only. It does not include data from state residential, private, charter or federal schools. The purpose of this survey is to: get an overall view of school health services, to identify conditions and situations affecting students in North Carolina (inc. chronic disease and injuries), to gain a profile of the student to nurse ratio across the state, and to identify health policies in schools.¹

This survey contacts the 115 existing local education agencies (LEA). This is a decrease in LEA's across the state; until the 2004-2005 school year there were 117 LEA's. Since the 1997-1998 school year, a minimum of 95% of the LEA's responded to this survey, with the 2005-2006 school year reporting a 100% response rate.

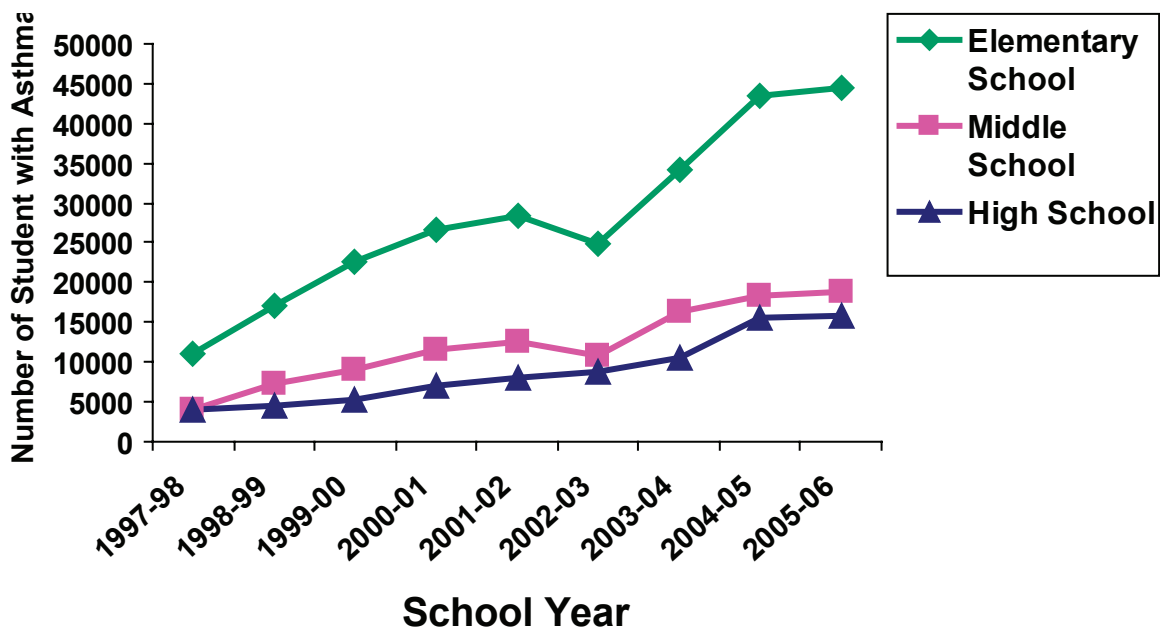
Number of Students with Asthma in Public Schools

Figure 1. Number of Students in Public Schools in North Carolina with Asthma, by School Year, 1996-2006.



Data Source: N.C. School Health Services Report for Public Schools 1996-2006

Figure 2. Number of Student in Public Schools in North Carolina with Current Asthma, by Grade Level, 1996-2006.



Data Source: N.C. School Health Services Report for Public Schools 1996-2006

Table 1. Prevalence of Current Asthma in Public Schools as Reported by School Nurses in the North Carolina Annual School Health Services Report, by School Level, North Carolina, 1996-2005

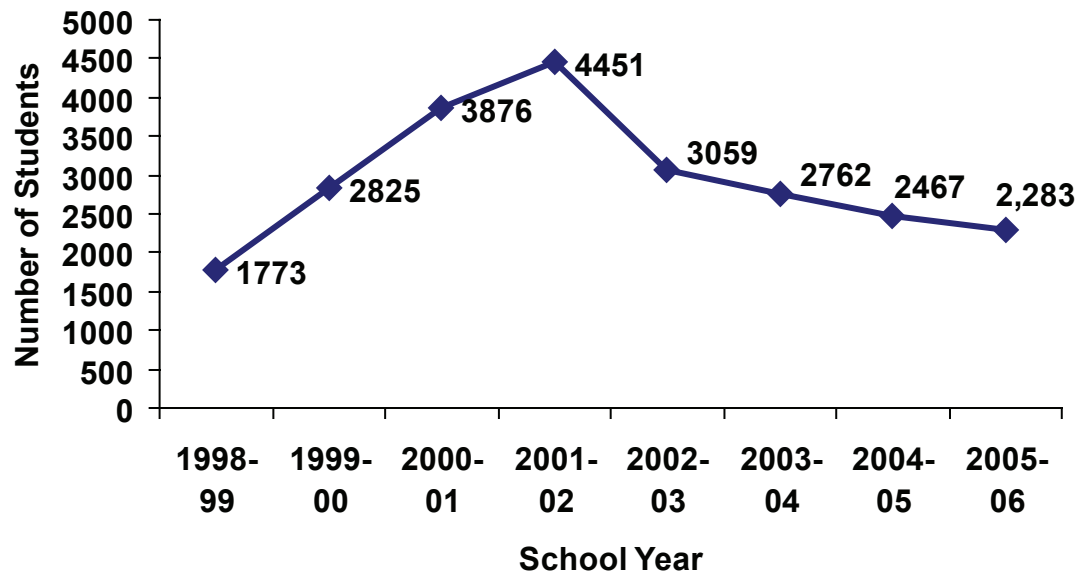
School Year	Elementary School	Middle School	High School	Grade Not	Total	Percent of Total Students with Asthma
1996-97	*	*	*	*	14,148	1.5%
1997-98	11,120	4,002	3,916	3,969	23,007	2.0%
1998-99	17,058	7,218	4,499	3,691	32,466	2.7%
1999-00	22,541	8,993	5,337	4,943	41,814	3.4%
2000-01	26,521	11,635	6,991	1,069	46,216	3.7%
2001-02	28,289	12,575	8,165	371	49,400	3.9%
2002-03	24,873	10,695	8,726	677	44,971	3.8%
2003-04	34,208	16,257	10,575	1,035	62,075	4.8%
2004-05	43,479	18,324	15,470	320	77,593	5.8%
2005-06	44,531	18,865	15,874	1,616	80,886	5.9%

Summary of Figure 1 and 2 and Table 1:

- Each year there are a number of students in North Carolina Public Schools who have asthma, but their grade level is unspecified.
- Because School nurses are not present full-time in the majority of North Carolina's schools, the number of students with chronic conditions is likely to be under reported.
- Examining the column "percent of total students with asthma", it is shown that the percent of public school students reported by the school nurse as having asthma is increasing. With the 2002 current asthma prevalence (according to the N.C. BRFSS) being 13.2% for children ≤ 17 years of age, and the 2005 current asthma prevalence (according to the N.C. CHAMP) for the same group being 11.5% (see figure 8 in the morbidity section), we see that the number of students with asthma shown in this survey are grossly under reported. More than half of the students in North Carolina Public Schools with current asthma are not identified to the school nurses. The number of students with actual asthma is potentially 2 times what is being reported here.

Asthma Management in Schools

Figure 3. Number of Students Participating in the "Open Airways" Asthma Management Curriculum.



Data Source: N.C. School Health Services Report for Public Schools, 1996-2006

The American Lung Association's ***Open Airways For Schools (OAS)*** is an asthma management program for school children age 8-11 who have been diagnosed with asthma. The program's goals are to:

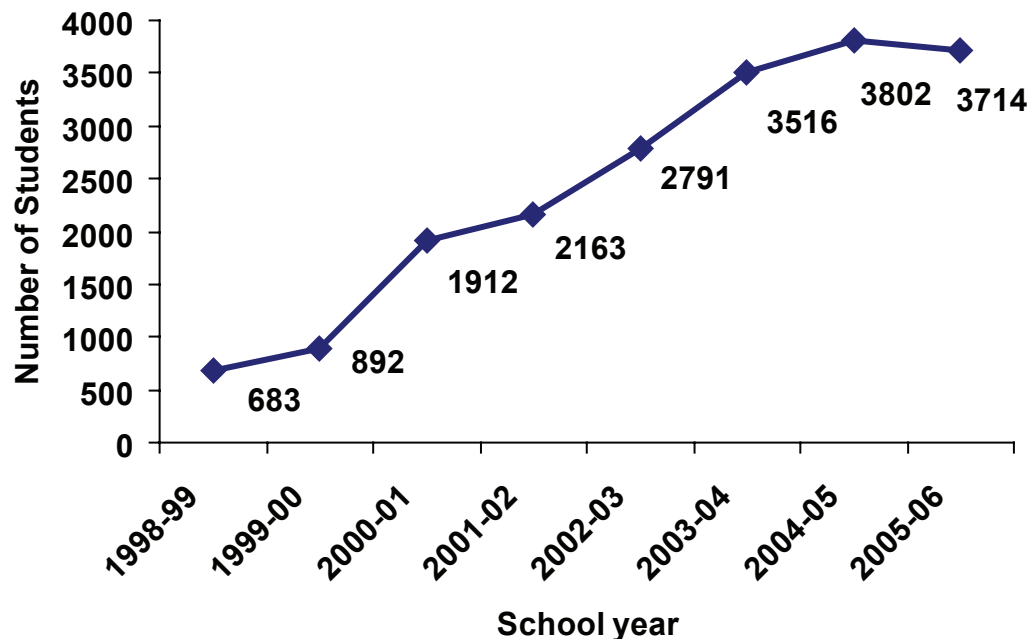
- improve asthma self-management skills
- decrease asthma emergencies
- raise asthma awareness among parents/guardians
- promote broader asthma management coordination among physicians, parents and schools

OAS consists of six 40-minute group lessons for children with asthma held during the school day, taught by a certified instructor. *OAS* uses group discussion, stories, games and role play to help students take part in the program. The class is taught as six 40 minute sessions during the school day by a certified instructor. Students are removed from their regular classrooms to participate in the class. The program works by teaching children that it is okay to have asthma and that they can take control of their asthma.²

The school nurse must get permission from the school to offer the program to students (not all schools allow the program to be offered), and also get parental permission for each student. Only students with signed permission slips are eligible to participate.

Asthma management in schools also occurs on a one-on-one basis between the school nurse and the student with asthma. These numbers are not tracked and therefore not available for this document.

Figure 4. Number of Students who use Peak Flow Monitoring at School.



Data Source: N.C. School Health Services Report for Public Schools, 1996-2006

Peak flow monitoring is done according to the student's Asthma Action Plan, which is signed by both the healthcare provider and the parent. If peak flow monitoring is not indicated on the Action Plan and the school nurse feels that the student could benefit from it, she may decide to contact the parent and/or the healthcare provider to have it included in the child's Action Plan. Peak flow monitoring is a tool to provide information on the student's respiratory status. By including this information in the student's Action Plan, the parents, health care provider, school nurse, and school staff can use this information to improve or maintain the student's respiratory status.

In elementary school, peak flow monitoring can be done by the student with assistance from either the school nurse or the teacher or other school personnel, after training from the school nurse. It should be observed by an adult to ensure that the readings are accurate and documented. Students in middle or high school should be able to do their own peak flow monitoring once they have been checked out by the school nurse, if this is so indicated on the Asthma Action Plan.¹

Table 2. Asthma Education in Public Schools as Reported by School Health Nurses, 1996-2006

School Year	LEA's Responding Count (Percent)	LEA's with Asthma Education Programs	# of Students taught "Open Airways" curriculum	# of Student who use Peak Flow Monitoring at School
1996-97	*	*	*	*
1997-98	111 (95%)	47	*	*
1998-99	113 (97%)	50	1,773	683
1999-00	113 (97%)	59	2,825	892
2000-01	115 (99.6%)	58	3,876	1,912
2001-02	115 (99.7%)	64	4,451	2,163
2002-03	111 (93%)	64	3,059	2,791
2003-04	115 (99%)	65	2,762	3,516
2004-05	115 (100%)	58	2,467	3,802
2005-06	115 (100%)	54	2,283	3,714

*Data not available

References:

1. Interview with Malyn Pratt, North Carolina State School Nurse Consultant, 8/31/2006.
2. American Lung Association. Open Airways for Schools (OAS). Retrieved 9/5/2006. Web site: <http://www.lungusa.org/site/pp.asp?c=dvLUK9O0E&b=44142>

Appendix H:
Medicaid Data



Appendix H. Medicaid Data

Currently, managed care options for Medicaid recipients are available in all 100 counties. Options include Community Care of North Carolina, which encompasses Carolina ACCESS and ACCESS II, and until 2006 included a Risk Contracting with a state-licensed HMO in Mecklenburg County. The following descriptions of the managed care programs in North Carolina were obtained from the North Carolina Division of Medical Assistance (DMA) website (www.dhhs.state.nc.us/dma/).

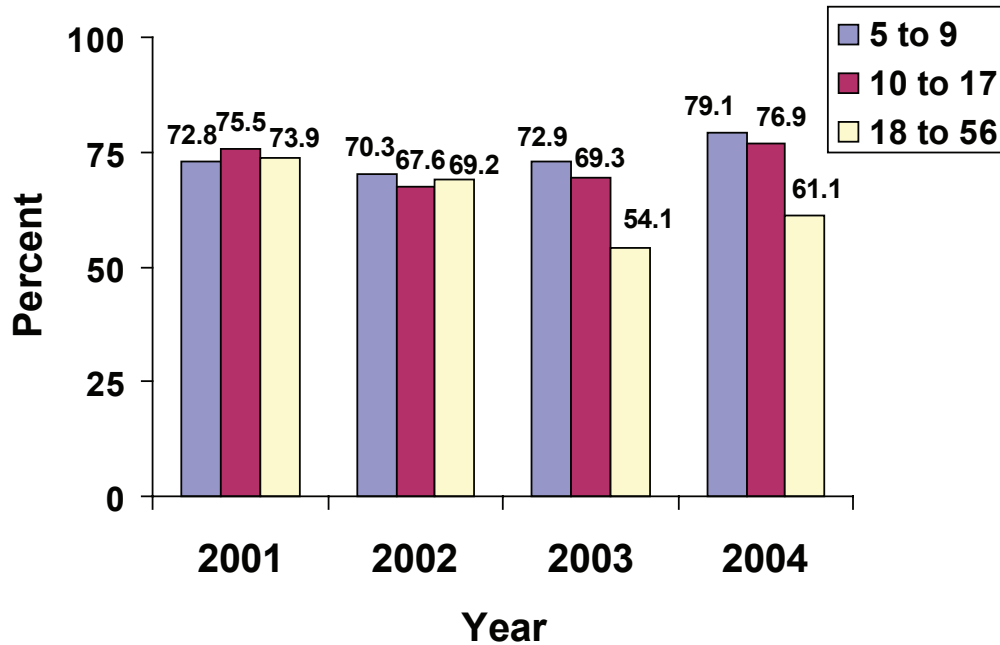
Carolina ACCESS was implemented in April 1991. It is North Carolina's Primary Care Case Management Program. It is designed to provide a more efficient and effective healthcare delivery system for Medicaid recipients. Carolina ACCESS links eligible recipients with a primary care provider (a medical home) who has agreed to provide or arrange for healthcare services for each enrollee.¹

ACCESS II/III, which is referred to as Community Care of North Carolina, was developed to build on Carolina Access by working with local providers and networks to manage the Medicaid population with processes that impact both the quality and cost of healthcare. ACCESS II/III include local networks comprised of Medicaid providers who have agreed to work together to develop the care management systems and supports that are needed to manage enrollee care.¹

Approximately 70% of the NC Medicaid population is enrolled in one of the Managed Care programs. The remaining 30% are enrolled in traditional fee for-service Medicaid. Managed care enrollment is dependent upon the recipients' eligibility classifications and/or special circumstances that would warrant an exemption from managed care.²

HEDIS measures

Figure 1. Use of Appropriate Medications¹ for Persons in Medicaid with Persistent Asthma², Age 5 to 56, North Carolina, 2001 – 2004³



¹While there are a number of acceptable therapies for people with persistent asthma, the best available evidence indicates that inhaled corticosteroids are the preferred primary therapy.⁴⁶

²NCQA standards for "persistent asthma" within the Medicaid population defined as: 1) four or more prescription medications used in the treatment of asthma in a year, OR 2) One or more inpatient hospital visits with a primary diagnosis of asthma in a year, OR 3) One or more ED visits with a primary diagnosis of asthma in a year, OR 4) Four or more outpatient visits with asthma listed anywhere as one of the diagnosis AND two or more claims for prescription drugs used in the treatment of asthma within 1 year.

³Please note that this is the description for the HEDIS measure for the study year 2004. Specifications are subject to change every year.

Data Source: North Carolina DMA HEDIS Reports, 2002 - 2005

Table 1. Use of Appropriate Medications for Persons in Medicaid with Persistent Asthma, by Age and System of Care, 2001-2004

Use of Appropriate Asthma Medications						
		CA I %	CA II/III* %	Aggregate HMO %	Fee for Service %	Total DMA %
AGE	Year					
5 to 9	2001	68.11	82.07	62	71.08	72.87
	2002	69.53	76.9	66.67	65.09	70.39
	2003	68.97	78.49	50	71.06	72.92
	2004	78.85	80.60	50	78.27	79.14
10-17	2001	73.44	82.48	61.67	73.2	75.55
	2002	65.99	73.95	62.96	64.03	67.63
	2003	68.92	74	50	66.29	69.31
	2004	76.87	80.21	55.56	74.59	76.97
18-56	2001	73.62	78.21	66.67	73.83	73.98
	2002	68.83	70.25	57.41	69.41	69.20
	2003	53.57	59.97	54.55	53.27	54.12
	2004	59.90	61.22	11.11	61.63	61.65
All Ages	2001	72.41	81.46	63.35	73.23	74.14
	2002	68.21	74.33	61.81	67.60	69.05
	2003	63.99	73.86	51.22	62.25	65.57
	2004	72.47	77.55	44.44	70.65	72.98

*Community Care of North Carolina

References

1. North Carolina Division of Medical Assistance. Managed Care: Summary of North Carolina's Managed Care Programs. North Carolina Department of Health and Human Services. Retrieved 9/11/2006.
Web site: <http://www.dhhs.state.nc.us/dma/mangecarewho.html>.
2. North Carolina Division of Medical Assistance. HEDIS Report 2005. North Carolina Department of Health and Human Services. Retrieved 9/5/2006.
Web site: http://www.dhhs.state.nc.us/dma/hedis/HEDIS2005_report.pdf.

Appendix I:
***Population Distribution
of North Carolina***



Appendix I. Population Distribution of North Carolina

Table 1. North Carolina and US Census Data by Sex, Age Group, 2005¹, Race and Ethnicity data, 2004

	Population	North Carolina Population Distribution (%) 2005	US Population Distribution (%) 2005
Male	4,277,092	49.3	49.3
Female	4,404,974	50.7	50.7
Under 5 years	582,302	6.7	6.8
5 to 9 years	578,963	6.7	6.6
10 to 14 years	590,694	6.8	7.0
15 to 19 years	602,355	6.9	7.1
20 to 24 years	654,250	7.5	7.1
25 to 34 years	1,200,560	13.8	13.5
35 to 44 years	1,308,068	15.1	15
45 to 54 years	1,223,323	14.1	14.3
55 to 59 years	514,424	5.9	5.9
60 to 64 years	392,971	4.5	4.4
65 to 74 years	555,809	6.4	6.3
75 to 84 years	353,145	4.1	4.4
85 years and older	125,202	1.4	1.7
Race Data (from 2004)			
One Race		98.7 ²	97.6 ²
White	6,374,728*	74.6	75.1 ²
Black or African American	1,889,220*	22.1	12.3 ²
American Indian or Alaskan Native	115,010*	1.3	0.9 ²
Asian, Native Hawaiian or Pacific Islander	162,263*	1.9	3.7 ²
Other Race		2.3 ²	5.5 ²
Two or more races		1.3 ²	2.4 ²
Hispanic or Latino (of any race)	517,617*	6.1	12.5 ²
Overall North Carolina Population	8,682,066	100%	

*These numbers differ slightly from the rest and do not combine to make the actual overall population as noted. They are taken from a different data source -NCHS Bridged Population Data (<http://www.schs.state.nc.us/SCHS/data/population/nchspop.cfm>) and break up race/ethnicity data in a way that the state demographer does not.

¹Taken from July 1, 2005 estimates unless otherwise denoted.

²Taken from the US Census Bureau, 2000 Census Demographic.

Data Source: U.S. Census Bureau, NC SCHS, and North Carolina State Demographics